Network-Based Call Signaling (NCS) Signaling MIB for PacketCable and IPCablecom Multimedia Terminal Adapters (MTAs)

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it provides a common data and format representation for PacketCable and IPCablecom compliant Multimedia Terminal Adapter devices.

This memo specifies a MIB module in a manner that is compliant to the SNMP SMIv2. The set of objects are consistent with the SNMP framework and existing SNMP standards.
Table of Contents

1. The Internet-Standard Management Framework.........................2
2. Terminology.........................................................................2
   2.1 MTA........................................................................3
   2.2 Endpoint...................................................................3
   2.3 L Line Package.....................................................3
   2.4 E Line Package.....................................................3
3. Overview...............................................................................3
   3.1 Structure of the MIB................................................4
   3.2 pktcSigDevConfigObjects.........................................4
   3.3 pktcSigNotification...............................................6
   3.4 pktcSigConformance...............................................6
4. Definitions............................................................................7
5. Acknowledgments..............................................................54
6. Normative References........................................................55
7. Informative References.......................................................55
8. Security Considerations.....................................................57
9. Intellectual Property........................................................58
10. Authors’ Addresses..........................................................59
11. Full Copyright Statement...................................................59

1. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Items in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL", when used in the guidelines in this memo, are to be interpreted as described in RFC 2119 [RFC2119].

The terms "MIB module" and "information module" are used interchangeably in this memo. As used here, both terms refer to any of the three types of information modules defined in Section 3 of RFC 2578 [RFC2578].
2.1 MTA

A Multimedia Terminal Adapter is a PacketCable or IPCablecom compliant device providing telephony services over a cable or hybrid system used to deliver video signals to a community. It contains an interface to endpoints, a network interface, CODECs, and all signaling and encapsulation functions required for Voice over IP transport, call signaling, and Quality of Service signaling. A MTA can be an embedded or a standalone device. An Embedded MTA (E-MTA) is a MTA device containing an embedded DOCSIS Cable Modem. A Standalone MTA (S-MTA) is a MTA device separated from the DOCSIS Cable Modem by non-DOCSIS MAC interface (e.g., Ethernet, USB).

2.2 Endpoint

An endpoint or MTA endpoint is a standard RJ-11 telephony physical port located on the MTA and used for attaching the telephone device to the MTA.

2.3 L Line Package

The L line package refers to the core signaling functionality as defined by PacketCable and IPCablecom. An MTA provides all L package elements, however the operator determines their application.

2.4 E Line Package

The E line package refers to extensions, over and above the core L package, defined in support of international requirements. E line package elements are optional, vary from country to country, and are set by operator or regulatory requirements.

3. Overview

This MIB provides a set of objects required for Signaling PacketCable and IPCablecom compliant Multimedia Terminal Adapter (MTA) devices. MTA devices include one or more endpoints (e.g., telephone ports) which receive signaling information to establish ring cadence, and codecs used for providing telephony service.

Telephone systems are typically very complex and often have a wide distribution. It is therefore important for management systems to support MTAs from multiple vendors at the same time, including those from multiple countries. This MIB module provides objects suitable for managing signaling for MTA devices in the widest possible variety of marketplaces.

Several normative and informative references are used to help define NCS Signaling MIB objects. As a convention, in the object REFERENCE
clauses, we use the PacketCable reference. IPCablecom compliant MTA devices MUST use the equivalent IPCablecom references.

3.1 Structure of the MIB

This MIB is identified by pktcSigMib and is structured in three groups:

- Signaling information that control device and endpoint configuration objects (pktcSigMibObjects)

- Signaling Notification object, that notifies the status (pktcSigNotification)

- Signaling Conformance has mandatory signaling objects (pktcSigConformance)

Each group of objects is explained in detail.

3.2 pktcSigDevConfigObjects

pktcSigDevEchoCancellation - This object identifies the capability of echo cancellation on the device.

pktcSigDevSilenceSuppression - This object specifies if the device is capable of silence suppression (Voice Activity Detection).

pktcSigDevR0Cadence - this object specifies ring cadence 0.

pktcSigDevR6Cadence - this object specifies ring cadence 6.

pktcSigDevR7Cadence - this object specifies ring cadence 7.

pktcSigDefCallSigDscp - this object specifies the default value used in the IP header for setting the Differentiated Services Code Point (DSCP) value for call signaling.

pktcSigDefMediaStreamDscp - this object specifies the default value used in the IP header for setting the Differentiated Services Code Point (DSCP) value for media stream packets.

pktcSigCapabilityTable - this table specifies list of supported signaling types, versions and vendor extensions for MTA.

pktcSigDefNcsReceiveUdpPort - this object contains the MTA User Datagram Protocol (UDP) receive port that is being used for NCS call signaling.
pktcSigServiceClassNameUS - this object contains a string indicating the Service Class Name to create an Upstream Service Flow for NCS.

pktcSigServiceClassNameDS - this object contains a string indicating the Service Class Name to create an Downstream Service Flow for NCS.

pktcSigServiceClassNameMask - this object contains a value for the Call Signaling Network Mask.

pktcSigNcsServiceFlowState - this object contains a status value of the Call Signaling Service Flow.

pktcSigDevR1Cadence - this object specifies ring cadence 1.

pktcSigDevR2Cadence - this object specifies ring cadence 2.

pktcSigDevR3Cadence - this object specifies ring cadence 3.

pktcSigDevR4Cadence - this object specifies ring cadence 4.

pktcSigDevR5Cadence - this object specifies ring cadence 5.

pktcSigDevRgCadence - this object specifies ring cadence rg.

pktcSigDevRsCadence - this object specifies ring cadence rs.

pktcSigDevCIDMode - this international object selects various modes of caller id in common use.

pktcSigDevCIDFskAfterRing - this international object sets the delay between the end of first ringing and the transmission of caller id information.

pktcSigDevCIDFskAfterDTAS - this international object sets the delay between the dual-tone alert signal and the transmission of caller id information.

pktcSigDevCIDFskAfterRPAS - this international object sets the delay between the ring pulse alert signal and the transmission of caller id information.

pktcSigDevCIDRingAfterFSK - this international object sets the delay between the transmission of caller id information and the first ringing pattern.

pktcSigDevCIDDTASAAfterLR - this international object sets the delay between the end of a line reversal and the dual-tone alert signal.
pktcSigDevVmwiMode - this object selects various modes of visual message waiting indicator service in common use.

pktcSigDevVmwiFskAfterDTAS - this international object sets the delay between the dual-tone alert signal and the transmission of visual message waiting information.

pktcSigDevVmwiFskAfterRPAS - this international object sets the delay between the ring pulse alert signal and the transmission of visual message waiting information.

pktcSigDevVmwiDTASAfterLR - this international object sets the delay between the end of a line reversal and the dual-tone alert signal for visual message waiting information.

pktcSigDevRingCadenceTable - this international object provides a flexible structure within which to specify a variety of ring cadences.

pktcSigDevStandardRingCadence - this international object specifies the standard ring assumed by the MTA.

pktcSigDevRingSplashCadence - this international object specifies the standard splash ring assumed by the MTA.

pktcSigDevToneTable - this international object specifies a flexible structure within which to specify all of the tones used in the MTA.

 pktcNcsEndPntConfigTable - this table describes the PacketCable NCS EndPoint configuration. The number of entries in this table represents the number of provisioned endpoints.

pktcSigEndPntConfigTable - this table describes the PacketCable EndPoint selected signaling type. The number of entries in this table represents the number of provisioned endpoints.

3.3 pktcSigNotification

pktcSigNotification - this object is used for signaling notification and reserved for future use.

3.4 pktcSigConformance

pktcSigCompliances - this table has one object that has compliance statements for devices that implement Signaling on the MTA.

pktcSigGroups - this table contains group of objects for the common portion of the PacketCable NCS and Signaling MIB.
4. Definitions

PKTC-IETF-SIG-MIB DEFINITIONS ::= BEGIN

IMPORTS
   MODULE-IDENTITY,
   OBJECT-TYPE,
   Integer32,
   Unsigned32,
   mib-2
      FROM SNMPv2-SMI
   InetAddressType,
   InetAddress,
   InetPortNumber
      FROM INET-ADDRESS-MIB
   TEXTUAL-CONVENTION,
   RowStatus,
   TruthValue
      FROM SNMPv2-TC
   OBJECT-GROUP,
   MODULE-COMPLIANCE
      FROM SNMPv2-CONF
   SnmpAdminString
      FROM SNMP-FRAMEWORK-MIB
   ifIndex
      FROM IF-MIB
   Dscp
      FROM DIFFSERV-DSCP-TC;

pktcSigMib MODULE-IDENTITY
   LAST-UPDATED "200402180000Z" -- February 18, 2004
   ORGANIZATION "IETF IPCDN Working Group"
   CONTACT-INFO
      "Satish Kumar Mudugere Eswaraiah
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      Louisville, Colorado - 80027
DESCRIPTION

"This MIB module supplies the basic management object for the PacketCable and IPCablecom Signaling protocols. This version of the MIB includes common signaling and Network Call Signaling (NCS) related signaling objects.

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-- RFC Ed: replace yyyy with actual RFC number and remove this note

REVISION

"200402180000Z"

DESCRIPTION

"Initial version, published as RFC yyyy."

-- RFC Ed: replace yyyy with actual RFC number and remove this note

::=  { mib-2 XXX }

-- RFC Ed: replace XXX with IANA-assigned number and remove this note

-- Textual Conventions

TenthdBm ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-1"

STATUS   current

DESCRIPTION

"This data type represents power levels that are normally expressed in dBm. Units are in tenths of a dBm; for example, -13.5 dBm will be represented as -135."
SYNTAX Integer32

PktcCodecType ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "Textual Convention defines various types of CODECs that
MAY be supported. The list of CODECs MUST be consistent
with the Codec RTP MAP Parameters Table in the PacketCable
CODEC specification. In-line embedded comments below
contain the Literal Codec Name for each CODEC. The Literal
Codec Name is the second column of the table with CODEC
RTP Map Parameters. Literal Codec Name Column contains the
CODEC name used in LCD of the NCS messages CRCX/MDCX and
is also used to identify the CODEC in the CMS
Provisioning Specification. RTP Map Parameter Column of
the Table contains the string used in the media attribute
line (a=) of the SDP parameters in NCS messages."
SYNTAX INTEGER {
  other  (1),
  unknown (2),
  g729   (3), -- G729
  reserved (4), -- reserved for future use
  g729E  (5), -- G729E
  pcmu   (6), -- PCMU
  g726at32 (7), -- G726-32
  g728   (8), -- G728
  pcma   (9), -- PCMA
  g726at16 (10), -- G726-16
  g726at24 (11), -- G726-24
  g726at40 (12) -- G726-40
}

PktcRingCadence ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This object represents a ring cadence and repeatable
characteristics in bit string format. The ring cadence
representation starts with the first 1 in the pattern (the
leading 0s in the MSB are padding and are to be ignored).
Each bit represents 100ms of tone; 1 is tone, 0 is no
tone. 64 bits MUST be used for cadence representation. The
LSB 4 bits of this object are used for representing
repeatable characteristics. 0000 means repeatable, and
1000 means non repeatable. During SNMP SET operations, 64
bits MUST be used, otherwise the MTA MUST reject the
value. As an example, the hex representation of a ring
cadence of 0.5 secs on; 4 secs off; repeatable would be:
0x0001F00000000000."
SYNTAX BITS {
<table>
<thead>
<tr>
<th>interval1</th>
<th>(0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>interval2</td>
<td>(1)</td>
</tr>
<tr>
<td>interval3</td>
<td>(2)</td>
</tr>
<tr>
<td>interval4</td>
<td>(3)</td>
</tr>
<tr>
<td>interval5</td>
<td>(4)</td>
</tr>
<tr>
<td>interval6</td>
<td>(5)</td>
</tr>
<tr>
<td>interval7</td>
<td>(6)</td>
</tr>
<tr>
<td>interval8</td>
<td>(7)</td>
</tr>
<tr>
<td>interval9</td>
<td>(8)</td>
</tr>
<tr>
<td>interval10</td>
<td>(9)</td>
</tr>
<tr>
<td>interval11</td>
<td>(10)</td>
</tr>
<tr>
<td>interval12</td>
<td>(11)</td>
</tr>
<tr>
<td>interval13</td>
<td>(12)</td>
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<td>interval14</td>
<td>(13)</td>
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<td>interval15</td>
<td>(14)</td>
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<td>interval16</td>
<td>(15)</td>
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<td>interval17</td>
<td>(16)</td>
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<td>interval18</td>
<td>(17)</td>
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<td>interval19</td>
<td>(18)</td>
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<td>interval20</td>
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<td>interval21</td>
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<td>interval22</td>
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<td>interval23</td>
<td>(22)</td>
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<td>interval24</td>
<td>(23)</td>
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<td>interval25</td>
<td>(24)</td>
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<tr>
<td>interval26</td>
<td>(25)</td>
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<tr>
<td>interval27</td>
<td>(26)</td>
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<tr>
<td>interval28</td>
<td>(27)</td>
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<tr>
<td>interval29</td>
<td>(28)</td>
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<tr>
<td>interval30</td>
<td>(29)</td>
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<tr>
<td>interval31</td>
<td>(30)</td>
</tr>
<tr>
<td>interval32</td>
<td>(31)</td>
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<td>interval33</td>
<td>(32)</td>
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<tr>
<td>interval34</td>
<td>(33)</td>
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<td>interval35</td>
<td>(34)</td>
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<tr>
<td>interval36</td>
<td>(35)</td>
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<td>interval37</td>
<td>(36)</td>
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<tr>
<td>interval38</td>
<td>(37)</td>
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<td>interval39</td>
<td>(38)</td>
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<td>interval40</td>
<td>(39)</td>
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<td>interval41</td>
<td>(40)</td>
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<td>interval42</td>
<td>(41)</td>
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<td>interval43</td>
<td>(42)</td>
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<td>interval44</td>
<td>(43)</td>
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<td>interval45</td>
<td>(44)</td>
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<tr>
<td>interval46</td>
<td>(45)</td>
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<td>interval47</td>
<td>(46)</td>
</tr>
<tr>
<td>interval48</td>
<td>(47)</td>
</tr>
<tr>
<td>interval49</td>
<td>(48)</td>
</tr>
</tbody>
</table>
PktcSigType ::= TEXTUAL-CONVENTION
     STATUS current
     DESCRIPTION "This object lists the various types of signaling that may be supported.
     ncs - Network call signaling is a derivation of MGCP (Media Gateway Control Protocol) defined for IPCablecom/PacketCable MTAs."
     SYNTAX INTEGER {
       other(1),
       reserved(2), -- reserved for future use
       ncs(3)
     }

pktcSigMibObjects OBJECT IDENTIFIER ::= { pktcSigMib 1 }
pktcSigDevConfigObjects OBJECT IDENTIFIER ::= {
  pktcSigMibObjects 1 }
pktcNcsEndPntConfigObjects OBJECT IDENTIFIER ::= {
  pktcSigMibObjects 2 }
pktcSigEndPntConfigObjects OBJECT IDENTIFIER ::= {
  pktcSigMibObjects 3 }

-- The codec table (pktcSigDevCodecTable) defines all combinations
-- of codecs supported by the Multimedia Terminal Adapter (MTA).
--
pktcSigDevCodecTable OBJECT-TYPE
  SYNTAX      SEQUENCE OF PktcSigDevCodecEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION "This table describes the MTA supported codec types. An MTA MUST populate this table with all possible combinations of
codecs it supports for simultaneous operation. For example, an MTA with two endpoints may be designed with a particular DSP and memory architecture that allows it to support the following fixed combinations of codecs for simultaneous operation:

<table>
<thead>
<tr>
<th>Codec Type</th>
<th>Maximum Number of Simultaneous Codecs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCMA</td>
<td>3</td>
</tr>
<tr>
<td>PCMA</td>
<td>2</td>
</tr>
<tr>
<td>PCMU</td>
<td>1</td>
</tr>
<tr>
<td>PCMA</td>
<td>1</td>
</tr>
<tr>
<td>PCMU</td>
<td>2</td>
</tr>
<tr>
<td>PCMU</td>
<td>3</td>
</tr>
<tr>
<td>PCMA</td>
<td>1</td>
</tr>
<tr>
<td>G729</td>
<td>1</td>
</tr>
<tr>
<td>G729</td>
<td>2</td>
</tr>
<tr>
<td>PCMU</td>
<td>1</td>
</tr>
<tr>
<td>G729</td>
<td>1</td>
</tr>
</tbody>
</table>

Based on this example, the entries in the codec table would be:

```
CodecComboIndex  pktcSigDevCodecType  pktcSigDevCodecMax
  1               pcma                3
  2               pcma                2
  2               pcmu                1
  3               pcma                1
  3               pcmu                2
  4               pcmu                3
  5               pcma                1
  5               g729                1
  6               g729                2
  7               pcmu                1
  7               g729                1
```

An operator querying this table is able to determine all possible codec combinations the MTA is capable of simultaneously supporting.

```
pktcSigDevCodecEntry  OBJECT-TYPE
SYNTAX      PktcSigDevCodecEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"Each entry represents the maximum number of active connections with a particular codec the MTA is capable of supporting. Each row is indexed by a composite key consisting of a number enumerating the particular codec combination and the codec type."
INDEX { pktcSigDevCodecComboIndex, pktcSigDevCodeType }
::= { pktcSigDevCodecTable 1 }

PktcSigDevCodecEntry  ::= SEQUENCE {
  pktcSigDevCodecComboIndex    Unsigned32,
  pktcSigDevCodecType     PktcCodecType,
  pktcSigDevCodecMax      Unsigned32
}

pktcSigDevCodecComboIndex  OBJECT-TYPE
SYNTAX      Unsigned32 (1..255)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
" The index value which enumerates a particular codec combination in the pktcSigDevCodecTable."
::= { pktcSigDevCodecEntry 1 }

pktcSigDevCodecType  OBJECT-TYPE
SYNTAX       PktcCodecType
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
" A codec type supported by this MTA."
::= { pktcSigDevCodecEntry 2 }

pktcSigDevCodecMax  OBJECT-TYPE
SYNTAX      Unsigned32(1..255)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  
" The maximum number of simultaneous sessions of a particular codec that the MTA can support."
::= { pktcSigDevCodecEntry 3 }

--
-- These are the common signaling related definitions that affect
-- the entire MTA device.

pktcSigDevEchoCancellation  OBJECT-TYPE
SYNTAX       TruthValue
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
  "This object specifies if the device is capable of echo
cancellation."
::= { pktcSigDevConfigObjects 2 }

pktcSigDevSilenceSuppression  OBJECT-TYPE
SYNTAX       TruthValue
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
  "This object specifies if the device is capable of
silence suppression (Voice Activity Detection)."
::= { pktcSigDevConfigObjects 3 }

pktcSigDevCallerIdSigProtocol  OBJECT-TYPE
SYNTAX       INTEGER {
    fsk   (1),
    dtmf  (2)
}
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
  "This object identifies the subscriber line protocol used
for signaling on-hook caller id information."
REFERENCE
  "EN 300 659-1 Specification"
DEFVAL { fsk }
::= { pktcSigDevConfigObjects 4 }

--
-- In the United States Ring Cadences 0, 6, and 7 are custom ring
-- cadences definable by the system administrator. The following
-- three objects are used for these definitions.
--

pktcSigDevR0Cadence     OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
  "This object specifies ring cadence 0 (a user defined
field) where each bit represents a duration of 100
milliseconds (6 seconds total), except the LSB 4 bits
which are used to represent repeatable characteristics."
DEFVAL {{ interval1, interval2, interval3, interval4, interval5,
  interval6, interval7, interval8, interval9,
  interval10, interval11, interval12, interval13,
  interval14, interval15, interval16, interval17,
  interval18, interval19, interval20 }}
-- 11111111111111111111000000000000000000000000000000000000000
-- 00000
::= { pktcSigDevConfigObjects 5 }
pktcSigDevR6Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
" This object specifies ring cadence 6 (a user defined
field) where each bit represents a duration of 100
milliseconds (6 seconds total), except the LSB 4 bits
which are used to represent repeatable characteristics."
DEFVAL {{ interval1, interval2, interval3, interval4, interval5,
  interval6, interval7, interval8, interval9,
  interval10, interval11, interval12, interval13,
  interval14, interval15, interval16, interval17,
  interval18, interval19, interval20 }}
-- 11111111111111111111000000000000000000000000000000000000000
-- 00000
::= { pktcSigDevConfigObjects 6 }
pktcSigDevR7Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
" This object specifies ring cadence 7 (a user defined
field) where each bit represents a duration of 100
milliseconds (6 seconds total), except the LSB 4 bits
which are used to represent repeatable characteristics."
DEFVAL {{ interval1, interval2, interval3, interval4, interval5,
  interval6, interval7, interval8, interval9,
  interval10, interval11, interval12, interval13,
  interval14, interval15, interval16, interval17,
  interval18, interval19, interval20 }}
-- 11111111111111111111000000000000000000000000000000000000000
-- 00000
::= { pktcSigDevConfigObjects 7 }
pktcSigDefCallSigDscp  OBJECT-TYPE
SYNTAX      Dscp  -- RFC 3289: DIFFSERV-DSCP-TC
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The default value used in the IP header for setting the Differentiated Services Code Point (DSCP) value for call signaling."
DEFVAL { 0 }
::= { pktcSigDevConfigObjects 8 }

pktcSigDefMediaStreamDscp OBJECT-TYPE
SYNTAX Dscp -- RFC 3289: DIFFSERV-DSCP-TC
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The default value used in the IP header for setting the Differentiated Services Code Point (DSCP) value for media stream packets."
DEFVAL { 0 }
::= { pktcSigDevConfigObjects 9 }

--
-- pktcSigCapabilityTable - This table defines the valid signaling types supported by this MTA.
--

pktcSigCapabilityTable OBJECT-TYPE
SYNTAX SEQUENCE OF PktcSigCapabilityEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table describes the signaling types supported by this MTA."
::= { pktcSigDevConfigObjects 10 }

pktcSigCapabilityEntry OBJECT-TYPE
SYNTAX PktcSigCapabilityEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Entries in pktcMtaDevSigCapabilityTable - List of supported signaling types, versions and vendor extensions for this MTA. Each entry in the list provides for one signaling type and version combination. If the device supports multiple versions of the same signaling type it will require multiple entries."
INDEX { pktcSignalingIndex }
::= { pktcSigCapabilityTable 1 }

PktcSigCapabilityEntry ::= SEQUENCE {
pktcSignalingIndex Unsigned32,
pktcSignalingType PktcSigType,
pktcSignalingVersion SnmpAdminString,
pktcSignalingVendorExtension SnmpAdminString
}

pktcSignalingIndex OBJECT-TYPE
SYNTAX Unsigned32 (1..255)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The index value which uniquely identifies an entry in the pktcSigCapabilityTable."
::= { pktcSigCapabilityEntry 1 }

pktcSignalingType OBJECT-TYPE
SYNTAX PktcSigType
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This object identifies the type of signaling used. This value has to be associated with a single signaling version."
::= { pktcSigCapabilityEntry 2 }

pktcSignalingVersion OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Provides the version of the signaling type - reference pktcSignalingType. Examples would be 1.0 or 2.33 etc."
::= { pktcSigCapabilityEntry 3 }

pktcSignalingVendorExtension OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The vendor extension allows vendors to provide a list of additional capabilities, vendors can decide how to encode these extensions, although space separated text is suggested."
::= { pktcSigCapabilityEntry 4 }

pktcSigDefNcsReceiveUdpPort OBJECT-TYPE
SYNTAX InetPortNumber (1025..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object contains the MTA User Datagram Protocol (UDP) receive port that is being used for NCS call signaling. This object should only be changed by the configuration file."

REFERENCE
"PacketCable NCS Specification"

DEFVAL { 2427 }
::= { pktcSigDevConfigObjects 11 }

pktcSigServiceClassNameUS  OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE (0..15))
MAX-ACCESS  read-write
STATUS     current
DESCRIPTION
"This object contains a string indicating the Service Class Name to create an Upstream Service Flow for NCS. If the object has an empty string value then the NCS SF is not created and the best effort primary SF is used for NCS data. If this object is set to a non-empty (non-zero length) string, the MTA MUST create the NCS SF if it does not currently exist and the pktcSigServiceClassNameMask object has a non-zero value. If this object is subsequently set to an empty (zero-length) string, the MTA MUST delete the NCS SF if it exists. Setting this object to a different value does not cause the US SF to be re-created. The string MUST contain printable ASCII characters. The length of the string does not include a terminating zero. The MTA MUST append a terminating zero when the MTA creates the service flow."

DEFVAL { "" }
::= { pktcSigDevConfigObjects 12 }

pktcSigServiceClassNameDS  OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE (0..15))
MAX-ACCESS  read-write
STATUS     current
DESCRIPTION
"This object contains a string indicating the Service Class Name to create a Downstream Service Flow for NCS. If the object has an empty string value then the NCS SF is not created and the best effort primary SF is used for NCS data. If this object is set to a non-empty (non-zero length) string, the MTA MUST create the NCS SF if it does not currently exist and the pktcSigServiceClassNameMask object has a non-zero value. If this object is subsequently set to an empty (zero-length) string, the MTA MUST delete the NCS SF if it exists. Setting this object to a different value does not cause the DS SF to..."
be re-created. The string MUST contain printable ASCII characters. The length of the string does not include a terminating zero. The MTA MUST append a terminating zero when the MTA creates the service flow.

DEFVAL { "" }
 ::= { pktcSigDevConfigObjects 13 }

pktcSigServiceClassNameMask OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object contains a value used for the NCS Call Signaling classifier mask. If this object is set to a zero value, the MTA MUST delete both NCS SFs. When this object is set to a non-zero value, the MTA MUST create the NCS SF for which the corresponding MIB object (pktcSigServiceClassNameUS or pktcSigServiceClassNameDS) has a non-empty value, if the NCS SF does not already exist."
DEFVAL { 0 }
 ::= { pktcSigDevConfigObjects 14 }

pktcSigNcsServiceFlowState OBJECT-TYPE
SYNTAX INTEGER {
  notactive  (1),
  active     (2),
  error      (3)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object contains a status value of the Call Signaling Service Flow.
- notactive indicates that the NCS SF is not being used, and has not tried to be created,
- active indicates that the NCS SF is in use,
- error indicates that the NCS SF creation resulted in an error and the best effort channel is used for NCS Signaling."
 ::= { pktcSigDevConfigObjects 15 }

pktcSigDevR1Cadence OBJECT-TYPE
SYNTAX PktcRingCadence
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object specifies ring cadence 1 (a user defined field) where each bit represents a duration of 100
milliseconds (6 seconds total), except the LSB 4 bits which are used to represent repeatable characteristics."
DEFVAL {{ interval1, interval2, interval3, interval4, interval5, interval6, interval7, interval8, interval9, interval10, interval11, interval12, interval13, interval14, interval15, interval16, interval17, interval18, interval19, interval20 }}
-- 11111111111111111111000000000000000000000000000000000000000
-- 00000
::= { pktcSigDevConfigObjects 16 }

pktcSigDevR2Cadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object specifies ring cadence 2 (a user defined field) where each bit represents a duration of 100 milliseconds (6 seconds total), except the LSB 4 bits which are used to represent repeatable characteristics."
DEFVAL {{ interval1, interval2, interval3, interval4, interval5, interval6, interval7, interval8, interval13, interval14, interval15, interval16, interval17, interval18, interval19, interval20 }}
-- 11111111000011111111000000000000000000000000000000000000000
-- 00000
::= { pktcSigDevConfigObjects 17 }

pktcSigDevR3Cadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object specifies ring cadence 3 (a user defined field) where each bit represents a duration of 100 milliseconds (6 seconds total), except the LSB 4 bits which are used to represent repeatable characteristics."
DEFVAL {{ interval1, interval2, interval3, interval4, interval7, interval8, interval9, interval10, interval13, interval14, interval15, interval16, interval17, interval18, interval19, interval20 }}
-- 11110011110011111111000000000000000000000000000000000000000
-- 00000
::= { pktcSigDevConfigObjects 18 }

pktcSigDevR4Cadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current

Beacham/Kumar/Channabasappa Expires - July 2004
DESCRIPTION

"This object specifies ring cadence 4 (a user defined field) where each bit represents a duration of 100 milliseconds (6 seconds total), except the LSB 4 bits which are used to represent repeatable characteristics."

DEFVAL {{ interval1, interval2, interval3, interval6, interval7, interval8, interval9, interval10, interval11, interval12, interval13, interval14, interval15, interval18, interval19, interval20 }}

-- 111001111111110011100000000000000000000000000000000000000000 
-- 00000
::= { pktcSigDevConfigObjects 19 }

pktcSigDevR5Cadence OBJECT-TYPE
SYNTAX PktcRingCadence
MAX-ACCESS read-write
STATUS current
DESCRIPTION

"This object specifies ring cadence 5 (a user defined field) where each bit represents a duration of 100 milliseconds, except the LSB 4 bits which are used to represent repeatable characteristics."

DEFVAL {{ interval1, interval2, interval3, interval4, interval5, repeat1 }}

-- 111110000000000000000000000000000000000000000000000000000000 
-- 01000
::= { pktcSigDevConfigObjects 20 }

pktcSigDevRgCadence OBJECT-TYPE
SYNTAX PktcRingCadence
MAX-ACCESS read-write
STATUS current
DESCRIPTION

"This object specifies ring cadence rg (a user defined field) where each bit represents a duration of 100 milliseconds (6 seconds total), except the LSB 4 bits which are used to represent repeatable characteristics. This object is required for the L line package."

DEFVAL {{ interval1, interval2, interval3, interval4, interval5, interval6, interval7, interval8, interval9, interval10, interval11, interval12, interval13, interval14, interval15, interval16, interval17, interval18, interval19, interval20 }}

-- 11111111111111111111000000000000000000000000000000000000000 
-- 00000
::= { pktcSigDevConfigObjects 21 }

pktcSigDevRsCadence OBJECT-TYPE
SYNTAX PktcRingCadence
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object specifies ring cadence rs (a user defined field) where each bit represents a duration of 100 milliseconds (6 seconds total), except the LSB 4 bits which are used to represent repeatable characteristics. The MTA MUST reject any attempt to make this object repeatable. This object is required for the L line package."
DEFVAL {{ interval1, interval2, interval3, interval4, interval5, repeat1 }}
-- 11111000000000000000000000000000000000000000000000000000000
-- 01000
::= { pktcSigDevConfigObjects 22 }

pktcSigPowerRingFrequency OBJECT-TYPE
SYNTAX INTEGER {
f20Hz(1),
f25Hz(2),
f33Point33Hz(3),
f50Hz(4),
f15Hz(5),
f16Hz(6),
f22Hz(7),
f23Hz(8),
f45Hz(9)
}
UNITS "Hertz"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object must only be set via the configuration file during the provisioning process. The power ring frequency is the frequency at which the sinusoidal voltage must travel down the twisted pair to make terminal equipment ring. Different countries define different electrical characteristics to make terminal equipment ring."
REFERENCE
"EN 300 001 contains a list of frequency ranges that are defined for each country."
DEFVAL { f20Hz }
::= { pktcSigDevConfigObjects 23 }

pktcSigPulseSignalTable OBJECT-TYPE
SYNTAX SEQUENCE OF PktcSigPulseSignalEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
The Pulse signal table defines the pulse signal operation. There are nine types of international pulse signals, with each signal having a set of provisionable parameters. The values of the MIB objects in this table take effect only if these parameters are not defined via signaling, in which case the latter determines the values of the parameters. This object is required for the E line package. Signals defined in this table are triggered using the E line package.

Objects in this table do not persist across MTA reboots.

REFERENCE
"TS 101 909-4 Specification"

pktcSigPulseSignalEntry OBJECT-TYPE
SYNTAX PktcSigPulseSignalEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This object defines the set of parameters associated with each particular value of pktcSigPulseSignalType. Each entry in the pktcSigPulseSignalTable is indexed by the pktcSigPulseSignalType object."
INDEX { pktcSigPulseSignalIndex }
 ::= { pktcSigPulseSignalTable 1 }

PktcSigPulseSignalEntry ::= SEQUENCE {
   pktcSigPulseSignalType              INTEGER,
   pktcSigPulseSignalFrequency         INTEGER,
   pktcSigPulseSignalDbLevel           TenthdBm,
   pktcSigPulseSignalDuration          Unsigned32,
   pktcSigPulseSignalPulseInterval     Unsigned32,
   pktcSigPulseSignalRepeatCount       Unsigned32
}

pktcSigPulseSignalType OBJECT-TYPE
SYNTAX INTEGER
{} { initialRing(1),
   pulseLoopClose(2),
   pulseLoopOpen(3),
   enableMeterPulse(4),
   meterPulseBurst(5),
   pulseNoBattery(6),
   pulseNormalPolarity(7),
   pulseReducedBattery(8),
   pulseReversePolarity(9) }

MAX-ACCESS not-accessible
STATUS         current
DESCRIPTION    "There are nine types of international pulse signals."
REFERENCE      "EN 300 324-1 Specification"
::= { pktcSigPulseSignalEntry 1 }

pktcSigPulseSignalFrequency    OBJECT-TYPE
SYNTAX       INTEGER {
    twentyfive (1),
    twelvethousand(2),
    sixteenthousand(3)
}
UNITS        "Hertz"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION    "This object is only applicable to the initialRing, enableMeterPulse, and meterPulseBurst signal type. This object identifies the frequency of the generated signal. The following table defines the default values for this object depending on signal type:

<table>
<thead>
<tr>
<th>Signal Type</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>initialRing</td>
<td>25</td>
</tr>
<tr>
<td>enableMeterPulse</td>
<td>16000</td>
</tr>
<tr>
<td>meterPulseBurst</td>
<td>16000</td>
</tr>
</tbody>
</table>

The value of twentyfive must only be used for the initialRing signal type. The values of twelvethousand and sixteenthousand must only be used for enableMeterPulse and meterPulseBurst signal types."
REFERENCE      "EN 300 001 Specification"
::= { pktcSigPulseSignalEntry 2 }

pktcSigPulseSignalDbLevel    OBJECT-TYPE
SYNTAX       TenthdBm (-250..152)
UNITS        "dbm"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION    "This object is only applicable to the enableMeterPulse and meterPulseBurst signal types. This is the decibel level for each frequency at which tones could be generated at the a and b terminals (TE connection point)."
REFERENCE      "EN 300 001 Specification"
DEFVAL { -135 }
::={pktcSigPulseSignalEntry 3 }
packetSigPulseSignalDuration OBJECT-TYPE
SYNTAX    Unsigned32 (0..5000)
UNITS     "Milliseconds"
MAX-ACCESS read-write
STATUS    current
DESCRIPTION
"This object specifies the pulse duration for each
signal type. In addition, the MTA must accept the values
in the incremental steps specific for each signal type.
The following table defines the default values and the
incremental steps for this object depending on the signal
type.

<table>
<thead>
<tr>
<th>signal type</th>
<th>Default (ms)</th>
<th>Increment (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>initialRing</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>pulseLoopClose</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>pulseLoopOpen</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>enableMeterPulse</td>
<td>150</td>
<td>10</td>
</tr>
<tr>
<td>meterPulseBurst</td>
<td>150</td>
<td>10</td>
</tr>
<tr>
<td>pulseNoBattery</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>pulseNormalPolarity</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>pulseReducedBattery</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>pulseReversePolarity</td>
<td>200</td>
<td>10</td>
</tr>
</tbody>
</table>

REFERENCE
"EN 300 324-1 Specification"
::= {packetSigPulseSignalEntry 4 }

packetSigPulseSignalPulseInterval OBJECT-TYPE
SYNTAX    Unsigned32 (0..5000)
UNITS     "Milliseconds"
MAX-ACCESS read-write
STATUS    current
DESCRIPTION
"This object specifies the repeat interval, or the period
for each signal type. In addition, the MTA must accept
the values in the incremental steps specific for each
signal type. The following table defines the default
values and the incremental steps for this object depending
on the signal type.

<table>
<thead>
<tr>
<th>signal type</th>
<th>Default (ms)</th>
<th>Increment (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>initialRing</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>pulseLoopClose</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>pulseLoopOpen</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>enableMeterPulse</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>meterPulseBurst</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>pulseNoBattery</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>pulseNormalPolarity</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>pulseReducedBattery</td>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>pulseReversePolarity</td>
<td>1000</td>
<td>10</td>
</tr>
</tbody>
</table>

REFERENCE
"EN 300 324-1 Specification"
 ::= { pktcSigPulseSignalEntry 5}

pktcSigPulseSignalRepeatCount   OBJECT-TYPE
SYNTAX       Unsigned32
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
 " This object specifies how many times to repeat a pulse.
 This object is not used by the enableMeterPulse signal
type and as such must have a value of zero. The following
table defines the default values and the valid ranges for
this object depending on the signal type.

<table>
<thead>
<tr>
<th>Signal Type</th>
<th>Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>initialRing</td>
<td>1</td>
<td>1-5</td>
</tr>
<tr>
<td>pulseLoopClose</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseLoopOpen</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>enableMeterPulse</td>
<td>0</td>
<td>Not Used</td>
</tr>
<tr>
<td>meterPulseBurst</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseNoBattery</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseNormalPolarity</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseReducedBattery</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseReversePolarity</td>
<td>1</td>
<td>1-50</td>
</tr>
</tbody>
</table>

 ::= { pktcSigPulseSignalEntry 6 }

pktcSigDevCIDMode    OBJECT-TYPE
SYNTAX       INTEGER {
    duringRingingETS(1),
    dtAsETS(2),
    rpAsETS(3),
    lrAsETS(4)
    }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 " This object is used for international systems only.
 For on-hook Caller ID, pktcSigDevCIDMode selects the
 method of Caller ID. For the duringRingingETS method, the
 FSK containing the Caller ID information is sent between
 the first and second ring pattern. For the dtAsETS,
rpAsETS, and lrAsETS methods, the FSK containing the
 Caller ID information is sent before the first ring
 pattern. For the dtAsETS method, the FSK is sent after the
 Dual Tone Alert Signal. For the rpAsETS method, the FSK is sent after a Ring
 Pulse. For the lrAsETS method, the Line Reversal occurs
 first, then the Dual Tone Alert Signal, and finally the
 FSK is sent."
DEFVAL { dtAsETS }
 ::= { pktcSigDevConfigObjects 25 }

pktcSigDevCIDFskAfterRing OBJECT-TYPE
SYNTAX Unsigned32 (50..2000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This object is used for international systems only. This object specifies the delay between the end of first ringing pattern and the start of the transmission of the FSK containing the Caller ID information. It is only used when pktcSigDevCIDMode is duringRingingETS.
 pktcSigDevCIDMode pktcSigDevCIDFskAfterRing
duringRingingETS 550 ms
dtAsETS not used
rpAsETS not used
lrAsETS not used"
REFERENCE "EN 300 659-1 Specification"
DEFVAL { 550 }
 ::= { pktcSigDevConfigObjects 26 }

pktcSigDevCIDFskAfterDTAS OBJECT-TYPE
SYNTAX Unsigned32 (45..500)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This object is used for international systems only. This object specifies the delay between the end of the Dual Tone Alert Signal (DT-AS) and the start of the transmission of the FSK containing the Caller ID information. This object is only used when pktcSigDevCIDMode is dtAsETS or lrAsETS.
 pktcSigDevCIDMode pktcSigDevCIDFskAfterDTAS
duringRingingETS not used
dtAsETS 50 ms
rpAsETS not used
lrAsETS 50 ms"
REFERENCE "EN 300 659-1 Specification"
DEFVAL { 50 }
 ::= { pktcSigDevConfigObjects 27 }

pktcSigDevCIDFskAfterRPAS OBJECT-TYPE
SYNTAX Unsigned32 (500..800)
UNITS "Milliseconds"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object is used for international systems only. This object specifies the delay between the end of the Ring Pulse Alert Signal (RP-AS) and the start of the transmission of the FSK containing the Caller ID information. This object is only used when pktcSigDevCIDMode is rpAsETS.

<table>
<thead>
<tr>
<th>pktcSigDevCIDMode</th>
<th>pktcSigDevCIDFskAfterRPAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>duringringingETS</td>
<td>not used</td>
</tr>
<tr>
<td>dtAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>650 ms</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>not used</td>
</tr>
</tbody>
</table>

REFERENCE
"EN 300 659-1 Specification"
DEFVAL { 650 }
::= {pktcSigDevConfigObjects 28 }

pktcSigDevCIDRingAfterFSK   OBJECT-TYPE
SYNTAX        Unsigned32 (50..500)
UNITS         "Milliseconds"
MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
" This object is used for international systems only. This object specifies the delay between the end of the complete transmission of the FSK containing the Caller ID information and the start of the first ring pattern. It is only used when pktcSigDevCIDMode is dtAsETS, rpAsETS or lrAsETS.

<table>
<thead>
<tr>
<th>pktcSigDevCIDMode</th>
<th>pktcSigDevCIDFskAfterFSK</th>
</tr>
</thead>
<tbody>
<tr>
<td>duringringingETS</td>
<td>not used</td>
</tr>
<tr>
<td>dtAsETS</td>
<td>250 ms</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>250 ms</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>250 ms</td>
</tr>
</tbody>
</table>

REFERENCE
"EN 300 659-1 Specification"
DEFVAL { 250 }
::= {pktcSigDevConfigObjects 29 }

pktcSigDevCIDDTASAfterLR   OBJECT-TYPE
SYNTAX        Unsigned32 (50..655)
UNITS         "Milliseconds"
MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
" This object is used for international systems only. This object specifies the delay between the end of the Line
Reversal and the start of the Dual Tone Alert Signal (DT-AS). This object is only used when pktcSigDevCIDMode is lrAsETS.

<table>
<thead>
<tr>
<th>pktcSigDevCIDMode</th>
<th>pktcSigDevCIDFskAfterLR</th>
</tr>
</thead>
<tbody>
<tr>
<td>duringringingETS</td>
<td>not used</td>
</tr>
<tr>
<td>dtAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>250 ms&quot;</td>
</tr>
</tbody>
</table>

REFERENCE

"EN 300 659-1 Specification"

DEFVAL { 250 }

::= {pktcSigDevConfigObjects 31 }

pktcSigDevVmwiMode OBJECT-TYPE
SYNTAX INTEGER {
  dtAsETS(1),
  rpAsETS(2),
  lrAsETS(3),
  osi(4)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" For visual message waiting indicator (VMWI), pktcSigDevVmwiMode selects the alerting signal method. For the dtAsETS, rpAsETS, lrAsETS, and OSI methods, the FSK containing the VMWI information is sent after an alerting signal. For the dtAsETS method, the FSK is sent after the Dual Tone Alert Signal. For the rpAsETS method, the FSK is sent after a Ring Pulse. For the lrAsETS method, the Line Reversal occurs first, then the Dual Tone Alert Signal, and finally the FSK is sent. For the OSI method, the FSK is sent after the Open Switching Interval."

DEFVAL { dtAsETS }
::= {pktcSigDevConfigObjects 32 }

pktcSigDevVmwiFskAfterDTAS OBJECT-TYPE
SYNTAX Unsigned32 (45..500)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This object is used for international systems only. This object specifies the delay between the end of the Dual Tone Alert Signal (DT-AS) and the start of the transmission of the FSK containing the VMWI information. This object is only used when pktcSigDevVmwiMode is
dtAsETS or lrAsETS.
pktcSigDevVmwiMode       pktcSigDevVmwiFskAfterDTAS
dtAsETS                  50 ms
rpAsETS                   not used
lrAsETS                   50 ms

REFERENCE
"EN 300 659-1 Specification"
DEFVAL { 50 }
::= {pktcSigDevConfigObjects 33 }

pktcSigDevVmwiFskAfterRPAS OBJECT-TYPE
SYNTAX       Unsigned32 (500..800)
UNITS        "Milliseconds"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object is used for international systems only. This object specifies the delay between the end of the Ring Pulse Alert Signal (RP-AS) and the start of the transmission of the FSK containing the VMWI information. This object is only used when pktcSigDevVmwiMode is rpAsETS.
pktcSigDevVmwiMode       pktcSigDevVmwiFskAfterRPAS
dtAsETS                  not used
rpAsETS                   650 ms
lrAsETS                   not used 

REFERENCE
"EN 300 659-1 Specification"
DEFVAL { 650 }
::= {pktcSigDevConfigObjects 34 }

pktcSigDevVmwiDTASAfterLR OBJECT-TYPE
SYNTAX       Unsigned32 (50..655)
UNITS        "Milliseconds"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object is used for international systems only. This object specifies the delay between the end of the Line Reversal and the start of the Dual Tone Alert Signal (DT-AS) for VMWI information. This object is only used when pktcSigDevVmwiMode is lrAsETS.
pktcSigDevVmwiMode       pktcSigDevVmwiDTASAfterLR
dtAsETS                  not used
rpAsETS                   not used
lrAsETS                   250 ms

REFERENCE
"EN 300 659-1 Specification"
DEFVAL { 250 }
::= { pktcSigDevConfigObjects 35 }

pktcSigDevRingCadenceTable OBJECT-TYPE
SYNTAX       SEQUENCE OF PktcSigDevRingCadenceEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
"In V5.2, Cadence rings are defined by the telco governing body for each country. The MTA must be able to support various ranges of cadence patterns and cadence periods. The MTA will be able to support country specific provisioning of the cadence and idle period. There will be at most 3 on/off transitions per cadence period. Each cadence pattern will be assigned a unique value ranging from 1-128 (inclusive) corresponding to the value of x plus one, where x is the value sent in the cr(x) signal requested per the appropriate NCS message, and defined in the E package. The MTA will derive the cadence periods from the ring Cadence table entry as provisioned by the customer. The MTA is allowed to provide appropriate default values for each of the ring cadences. This table only needs to be supported when the MTA implements the NCS E package. Objects in this table do not persist across MTA reboots."
REFERENCE
"TS 101 909-4 Specification"
::= { pktcSigDevConfigObjects 36 }

PktcSigDevRingCadenceEntry OBJECT-TYPE
SYNTAX       PktcSigDevRingCadenceEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
"Unique value ranging from 1 to 128 that corresponds to the value sent by the LE (plus one) based on country specific cadences, one row per cadence cycle. In any given system implementation for a particular country, it is anticipated that a small number of ring cadences will be in use. Thus, this table most likely will not be populated to its full 128-row size."
INDEX { pktcSigDevRingCadenceIndex }
::= { pktcSigDevRingCadenceTable 1 }

PktcSigDevRingCadenceEntry ::= SEQUENCE {
    pktcSigDevRingCadenceIndex       Unsigned32,
    pktcSigDevRingCadence            OCTET STRING
}
pktcSigDevRingCadenceIndex OBJECT-TYPE
SYNTAX Unsigned32 (1..128)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table index equivalent to the country specific cadence (1 - 128)."
::= { pktcSigDevRingCadenceEntry 1 }

pktcSigDevRingCadence OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(4..36))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the Ring Cadence Octet String. The first two octets of the bit string represent the length in bits of the duration of the cadence. The third octet is used to represent repeatable characteristics. 00000000 means repeatable, and 10000000 means non repeatable. Each Bit after the third octet represents 50 ms and 1 represents ring and 0 represents silent. The first bit of the fourth octet is the first bit of the ring cadence. A total of 264 Bits can be set to represent 13200 ms of total cadence cycle. This object is required for the E line package."
::= { pktcSigDevRingCadenceEntry 2 }

pktcSigDevStandardRingCadence OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(4..36))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the Ring Cadence Octet String for the standard ring. The first two octets of the bit string represent the length in bits of the duration of the cadence. The third octet is used to represent repeatable characteristics. 00000000 means repeatable, and 10000000 means non repeatable. Each Bit after the third octet represents 50 ms and 1 represents ring and 0 represents silent. The first bit of the fourth octet is the first bit of the ring cadence. A total of 264 Bits can be set to represent 13200 ms of cadence cycle. The MTA MUST provide a default value for this object in accordance with published specifications for the country of operation. This object is required for the E line package."
REFERENCE
"TR 101 183 Specification"
::= { pktcSigDevConfigObjects 37 }

pktcSigDevRingSplashCadence OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(4..36))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the Ring Cadence Octet String for splash ring. The first two octets of the bit string represent the length in bits of the duration of the cadence. The third octet is used to represent repeatable characteristics. 00000000 means repeatable, and 10000000 means non repeatable. Each Bit after the third octet represents 50 ms and 1 represents ring and 0 represents silent. The first bit of the fourth octet is the first bit of the ring cadence. A total of 264 Bits can be set to represent 13200 ms of cadence cycle. The MTA MUST provide a default value for this object in accordance with published specifications for the country of operation. This object is required for the E line package."

REFERENCE
"TR 101 183 Specification"
::= { pktcSigDevConfigObjects 38 }

pktcSigDevToneTable OBJECT-TYPE
SYNTAX SEQUENCE OF PktcSigDevToneEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The Tone Table defines the various tone operations. Any definition of the tones callWaiting1-4 in this table should just contain the audible tone itself and NOT contain the delay between tones or the tone repeat count. The delay between tones or the repeat count is controlled by the MIB objects pktcNcsEndPntConfigCallWaitingDelay, and pktcNcsEndPntConfigCallWaitingMaxRep. The MTA MUST make sure that, after the provisioning cycle, the table is fully populated (i.e., for each possible index, an entry MUST be defined) using reasonable defaults for each row that was not defined by the provisioning information. Objects in this table do not persist across MTA reboots."

REFERENCE
"NCS Specification, TS 101 909-4 Specification"
::= { pktcSigDevConfigObjects 39 }

pktcSigDevToneEntry OBJECT-TYPE
SYNTAX PktcSigDevToneEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Unique value ranging from 1 to 21 that will correspond to the different tone types that are being supported by the
device. These tones can be provisioned based on country specific needs.

INDEX { pktcSigDevToneType }
::= { pktcSigDevToneTable 1 }

PktcSigDevToneEntry ::= SEQUENCE {
pktcSigDevToneType                      INTEGER,
pktcSigDevToneDbLevel                   TenthDbm,
pktcSigDevToneFreqType                  INTEGER,
pktcSigDevToneNumFrequencies            Unsigned32,
pktcSigDevToneFirstFrequency           Unsigned32,
pktcSigDevToneSecondFrequency          Unsigned32,
pktcSigDevToneThirdFrequency           Unsigned32,
pktcSigDevToneFourthFrequency          Unsigned32,
pktcSigDevToneNumOnOffTimes             Unsigned32,
pktcSigDevToneFirstToneOn               Unsigned32,
pktcSigDevToneFirstToneOff              Unsigned32,
pktcSigDevToneSecondToneOn              Unsigned32,
pktcSigDevToneSecondToneOff             Unsigned32,
pktcSigDevToneThirdToneOn               Unsigned32,
pktcSigDevToneThirdToneOff              Unsigned32,
pktcSigDevToneFourthToneOn              Unsigned32,
pktcSigDevToneFourthToneOff             Unsigned32,
pktcSigDevToneWholeToneRepeatCount      Unsigned32,
pktcSigDevToneSteady                    TruthValue
}

pktcSigDevToneType        OBJECT-TYPE
SYNTAX       INTEGER {
baby(1),
confirmation(2),
dial(3),
messageWaiting(4),
offHookWarning(5),
ingBack(6),
reOrder(7),
stutterdial(8),
callWaiting1(9),
callWaiting2(10),
callWaiting3(11),
callWaiting4(12),
alertingSignal(13),
specialDial(14),
specialInfo(15),
release(16),
congestion(17),
userDefined1(18),
userDefined2(19),
userDefined3(20),
userDefined4(21)
}
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "This object defines the type of tone being accessed. The alertingSignal, specialDial, specialInfo, release, congestion and userDefined1-4 tone types are triggered using the E line package."
::={pktcSigDevToneEntry 1 }
pktcSigDevToneDbLevel OBJECT-TYPE
SYNTAX TenthdBm {-60..40}
UNITS "dbm"
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This is the decibel level for each frequency at which tones could be generated at the a and b terminals (TE connection point)."
DEFVAL {-40 }
::={pktcSigDevToneEntry 2 }
pktcSigDevToneFreqType OBJECT-TYPE
SYNTAX INTEGER {
   allFrequencies (1),
   singleFrequencySequence (2),
   dualFrequencySequence (3),
   allFrequenciesModulated (4)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This object describes how the frequencies are applied. allFrequencies indicates all frequencies specified by pktcSigDevToneNumFrequencies are mixed to form a single tone. The tone is then applied in sequence using the number of on/off times specified in pktcSigDevToneNumOnOffTimes. SingleFrequencySequence indicates all frequencies specified by pktcSigDevToneNumFrequencies are applied in sequence using the corresponding frequency number on/off time (e.g., pktcSigDevToneFirstFrequency uses pktcSigDevToneFirstToneOn and pktcSigDevToneFirstToneOff, pktcSigDevToneSecondFrequency uses pktcSigDevToneSecondToneOn and pktcSigDevToneSecondToneOff). For this tone type pktcSigDevToneNumFrequencies MUST equal pktcSigDevToneNumOnOffTimes. DualFrequencySequence
indicates two pairs of frequencies are added to form two sequenced tones. The first and second frequency are added to form tone one and are applied using pktcSigDevToneFirstToneOn and pktcSigDevToneFirstToneOff. The third and forth frequency are added to form tone two and are applied using pktcSigDevToneSecondToneOn and pktcSigDevToneSecondToneOff. For this tone type pktcSigDevToneNumFrequencies MUST equal 4 and pktcSigDevToneNumOnOffTimes MUST equal 2.

allFrequenciesModulated indicates all frequencies specified by pktcSigDevToneNumFrequencies are modulated to form a single tone. The tone is then applied in sequence using the number of on/off times specified in pktcSigDevToneNumOnOffTimes. For allFrequenciesModulated, the pktcSigDevToneNumFrequencies MUST equal 2, and the frequency in pktcSigDevToneFirstFrequency modulates the frequency in pktcSigDevToneSecondFrequency.

REFERENCE
"ITU-T E.180"

DEFVAL { allFrequencies }
::=( pktcSigDevToneEntry 3 )

pktcSigDevToneNumFrequencies    OBJECT-TYPE
SYNTAX       Unsigned32 (1..4)
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" Specifies the number of frequencies specified in the table entry."
DEFVAL { 1 }
::=(pktcSigDevToneEntry 4)

pktcSigDevToneFirstFrequency    OBJECT-TYPE
SYNTAX       Unsigned32 (0..4000)
UNITS        "Hertz"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This is the first frequency at which the tones could be generated in a multiple frequency tone."
::=(pktcSigDevToneEntry 5)

pktcSigDevToneSecondFrequency    OBJECT-TYPE
SYNTAX       Unsigned32 (0..4000)
UNITS        "Hertz"
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This is the second frequency at which the tones could be
generated in a multiple frequency tone.

 ::= {pktcSigDevToneEntry 6}

pktcSigDevToneThirdFrequency OBJECT-TYPE
SYNTAX Unsigned32 (0..4000)
UNITS "Hertz"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the third frequency at which the tones could be generated."
 ::= {pktcSigDevToneEntry 7}

pktcSigDevToneFourthFrequency OBJECT-TYPE
SYNTAX Unsigned32 (0..4000)
UNITS "Hertz"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the fourth frequency at which the tones could be generated."
 ::= {pktcSigDevToneEntry 8}

pktcSigDevToneNumOnOffTimes OBJECT-TYPE
SYNTAX Unsigned32 (1..4)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Specifies the number of on/off times specified in the table entry."
DEFVAL { 1 }
 ::= {pktcSigDevToneEntry 9}

pktcSigDevToneFirstToneOn OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the first tone interval."
 ::= {pktcSigDevToneEntry 10}

pktcSigDevToneFirstToneOff OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is the first idle interval."
::={ pktcSigDevToneEntry 11 }

pktcSigDevToneSecondToneOn OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This is the second tone interval."
::={ pktcSigDevToneEntry 12 }

pktcSigDevToneSecondToneOff OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This is the second idle interval."
::={ pktcSigDevToneEntry 13 }

pktcSigDevToneThirdToneOn OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This is the third tone interval."
::={ pktcSigDevToneEntry 14 }

pktcSigDevToneThirdToneOff OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This is the third idle interval."
::={ pktcSigDevToneEntry 15 }

pktcSigDevToneFourthToneOn OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" This is the fourth tone interval."
::={ pktcSigDevToneEntry 16 }

pktcSigDevToneFourthToneOff OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
UNITS "Milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This is the Fourth idle interval."
::={ pktcSigDevToneEntry 17 }

pktcSigDevToneWholeToneRepeatCount OBJECT-TYPE
SYNTAX Unsigned32 (0..5000)
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This is the repeat count, which signifies how many times to repeat the entire on-off sequence."
::={ pktcSigDevToneEntry 18 }

pktcSigDevToneSteady OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This is the steady tone. Device must playout the on-off sequence for pktcSigDevToneWholeRepeatCount times and then apply the last tone forever."
::={ pktcSigDevToneEntry 19 }

--
-- The NCS End Point Config Table is used to define attributes that -- are specific to connection EndPoints.
--

pktcNcsEndPntConfigTable OBJECT-TYPE
SYNTAX SEQUENCE OF PktcNcsEndPntConfigEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "This table describes the information pertaining to each endpoint of the MTA. All entries in this table represent the provisioned endpoints provisioned with the information required by the MTA to maintain the NCS signaling protocol communication with the CMS. Each endpoint can be assigned to its own CMS. If the specific endpoint does not have the corresponding CMS information in this table, the endpoint is considered as not provisioned with voice services. Objects in this table do not persist across MTA reboots."
::= { pktcNcsEndPntConfigObjects 1 }

pktcNcsEndPntConfigEntry OBJECT-TYPE
SYNTAX        PktcNcsEndPntConfigEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
" Entries in pktcNcsEndPntConfigTable û Each entry
represents the required signaling parameters for the
specific endpoint provisioned with voice services."
INDEX { ifIndex }
::= { pktcNcsEndPntConfigTable 1 }

PktcNcsEndPntConfigEntry  ::= SEQUENCE {
   pktcNcsEndPntConfigCallAgentId             SnmpAdminString,
pktcNcsEndPntConfigCallAgentUdpPort        InetPortNumber,
pktcNcsEndPntConfigPartialDialTO           Unsigned32,
pktcNcsEndPntConfigCriticalDialTO          Unsigned32,
pktcNcsEndPntConfigBusyToneTO              Unsigned32,
pktcNcsEndPntConfigDialToneTO              Unsigned32,
pktcNcsEndPntConfigMessageWaitingTO        Unsigned32,
pktcNcsEndPntConfigOffHookWarnToneTO       Unsigned32,
pktcNcsEndPntConfigRingingTO               Unsigned32,
pktcNcsEndPntConfigRingBackTO              Unsigned32,
pktcNcsEndPntConfigReorderToneTO           Unsigned32,
pktcNcsEndPntConfigStutterDialToneTO       Unsigned32,
pktcNcsEndPntConfigTSMax                   Unsigned32,
pktcNcsEndPntConfigMax1                    Unsigned32,
pktcNcsEndPntConfigMax2                    Unsigned32,
pktcNcsEndPntConfigMax1QEnable             TruthValue,
pktcNcsEndPntConfigMax2QEnable             TruthValue,
pktcNcsEndPntConfigMWD                     Unsigned32,
pktcNcsEndPntConfigTdinit                  Unsigned32,
pktcNcsEndPntConfigTdmin                   Unsigned32,
pktcNcsEndPntConfigTdmax                   Unsigned32,
pktcNcsEndPntConfigRtoMax                  Unsigned32,
pktcNcsEndPntConfigRtoInit                 Unsigned32,
pktcNcsEndPntConfigLongDurationKeepAlive   Unsigned32,
pktcNcsEndPntConfigThist                   Unsigned32,
pktcNcsEndPntConfigStatus                  RowStatus,
pktcNcsEndPntConfigCallWaitingMaxRep       Unsigned32,
pktcNcsEndPntConfigCallWaitingDelay        Unsigned32,
pktcNcsEndPntStatusCallIpAddressType       InetAddressType,
pktcNcsEndPntStatusCallIpAddress           InetAddress,
pktcNcsEndPntConfigMinHookFlash            Unsigned32,
pktcNcsEndPntConfigMaxHookFlash             Unsigned32,
pktcNcsEndPntConfigPulseDialInterdigitTime Unsigned32,
pktcNcsEndPntConfigPulseDialMinMakeTime    Unsigned32,
pktcNcsEndPntConfigPulseDialMaxMakeTime    Unsigned32,
pktcNcsEndPntConfigPulseDialMinBreakTime   Unsigned32,
pktcNcsEndPntConfigPulseDialMaxBreakTime   Unsigned32
pktcNcsEndPntConfigCallAgentId OBJECT-TYPE
SYNTAX      SnmpAdminString(SIZE (3..255))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"This object contains a string indicating the call agent
name. (e.g., @ca@example.com). The call agent name after
the @ character must be a fully qualified domain name and
have a corresponding pktcMtaDevCmsFqdn entry in the
pktcMtaDevCmsTable. The object pktcMtaDevCmsFqdn is
defined in the PacketCable MIBMTA Specification."
 ::= { pktcNcsEndPntConfigEntry 1 }

pktcNcsEndPntConfigCallAgentUdpPort OBJECT-TYPE
SYNTAX      InetPortNumber (1025..65535)
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"This object contains the call agent User Datagram Protocol
(UDP) receive port that is being used for this instance of
call signaling, i.e. the default port on which the call
agent will receive NCS signaling from the endpoint."
REFERENCE
"PacketCable NCS Specification"
DEFVAL    { 2727 }
 ::= { pktcNcsEndPntConfigEntry 2 }

pktcNcsEndPntConfigPartialDialTO OBJECT-TYPE
SYNTAX      Unsigned32
UNITS        "seconds"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"This object contains maximum value of the partial dial
time out."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
 ::= { pktcNcsEndPntConfigEntry 3 }

pktcNcsEndPntConfigCriticalDialTO OBJECT-TYPE
SYNTAX      Unsigned32
UNITS        "seconds"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"This object contains the maximum value of the critical
dial time out."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 4 }
::= { pktcNcsEndPntConfigEntry 4 }

pktcNcsEndPntConfigBusyToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the timeout value for busy tone."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 30 }
::= { pktcNcsEndPntConfigEntry 5 }

pktcNcsEndPntConfigDialToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the timeout value for dial tone."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
::= { pktcNcsEndPntConfigEntry 6 }

pktcNcsEndPntConfigMessageWaitingTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the timeout value for message waiting indicator."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
::= { pktcNcsEndPntConfigEntry 7 }

pktcNcsEndPntConfigOffHookWarnToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains timeout value for off hook Warning tone."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 0 }
::= { pktcNcsEndPntConfigEntry 8 }

pktcNcsEndPntConfigRingingTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the timeout value for ringing."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 180 }
::= { pktcNcsEndPntConfigEntry 9 }

pktcNcsEndPntConfigRingBackTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the timeout value for ring back."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 180 }
::= { pktcNcsEndPntConfigEntry 10 }

pktcNcsEndPntConfigReorderToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the timeout value for reorder tone."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 30 }
::= { pktcNcsEndPntConfigEntry 11 }

pktcNcsEndPntConfigStutterDialToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains timeout value for stutter dial tone."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
::= { pktcNcsEndPntConfigEntry 12 }

pktcNcsEndPntConfigTSMax OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"This object contains the max time in seconds since the
sending of the initial datagram."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 20 }
::= { pktcNcsEndPntConfigEntry 13 }

pktcNcsEndPntConfigMax1 OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"This object contains the suspicious error threshold for
signaling messages."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 5 }
::= { pktcNcsEndPntConfigEntry 14 }

pktcNcsEndPntConfigMax2 OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"This object contains the disconnect error threshold for
signaling messages."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 7 }
::= { pktcNcsEndPntConfigEntry 15 }

pktcNcsEndPntConfigMax1QEnable OBJECT-TYPE
SYNTAX    TruthValue
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"This object enables/disables the Max1 Domain Name Server
(DNS) query operation when Max1 expires."
DEFVAL { true } ::= { pktcNcsEndPntConfigEntry 16 }

pktcNcsEndPntConfigMax2QEnable OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-create
STATUS current
DESCRIPTION
" This object enables/disables the Max2 DNS query operation when Max2 expires."
DEFVAL { true } ::= { pktcNcsEndPntConfigEntry 17 }

pktcNcsEndPntConfigMWD OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
" Maximum Waiting Delay (MWD) contains the maximum number of seconds a MTA waits after a restart. When this timer expires the MTA initiates the restart procedure."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 600 } ::= { pktcNcsEndPntConfigEntry 18 }

pktcNcsEndPntConfigTdinit OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
" This object contains the initial number of seconds the MTA waits after a disconnect. When this timer expires the MTA initiates the disconnected procedure."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 15 } ::= { pktcNcsEndPntConfigEntry 19 }

pktcNcsEndPntConfigTdmin OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
" This object contains the minimum number of seconds the MTA waits after a disconnect. When this timer expires the MTA
initiates the disconnected procedure.

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 15 }
::= { pktcNcsEndPntConfigEntry 20 }

pktcNcsEndPntConfigTmax OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the maximum number of seconds the MTA waits after a disconnect. When this timer expires the MTA initiates the disconnected procedure."

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 600 }
::= { pktcNcsEndPntConfigEntry 21 }

pktcNcsEndPntConfigRtoMax OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the maximum number of seconds for the retransmission timer. When this timer expires the MTA retransmits the message."

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 4 }
::= { pktcNcsEndPntConfigEntry 22 }

pktcNcsEndPntConfigRtoInit OBJECT-TYPE
SYNTAX Unsigned32
UNITS "milliseconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the initial number of seconds for the retransmission timer."

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 200 }
::= { pktcNcsEndPntConfigEntry 23 }

pktcNcsEndPntConfigLongDurationKeepAlive OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "minutes"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
" Specifies a timeout value in minutes for sending long
duration call notification message."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 60 }
::= { pktcNcsEndPntConfigEntry 24 }

pktcNcsEndPntConfigThist  OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
" Timeout period in seconds before no response is declared."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 30 }
::= { pktcNcsEndPntConfigEntry 25 }

pktcNcsEndPntConfigStatus     OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
" This object contains the Row Status associated with the
pktcNcsEndPntTable."
::= { pktcNcsEndPntConfigEntry 26 }

pktcNcsEndPntConfigCallWaitingMaxRep     OBJECT-TYPE
SYNTAX      Unsigned32 (0..10)
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
" This object contains the maximum number of repetitions
of the call waiting tone that the MTA will play from a
single CMS request. A value of zero (0) can be used if
the CMS is to control the repetitions of the call waiting
tone."
DEFVAL    { 1 }
::= { pktcNcsEndPntConfigEntry 27 }

pktcNcsEndPntConfigCallWaitingDelay     OBJECT-TYPE
SYNTAX      Unsigned32 (1..100)
UNITS        "seconds"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION  "This object contains the delay between repetitions of the
call waiting tone that the MTA will play from a single CMS
request."
DEFVAL    { 10 }
 ::= { pktcNcsEndPntConfigEntry 28 }

pktcNcsEndPntStatusCallIpAddressType  OBJECT-TYPE
SYNTAX      InetAddressType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "This object contains the type of Internet address of the
CMS currently being used for this endpoint."
 ::= { pktcNcsEndPntConfigEntry 29 }

pktcNcsEndPntStatusCallIpAddress  OBJECT-TYPE
SYNTAX      InetAddress
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "This object contains the Internet address of the CMS
currently being used for this endpoint. This Internet
address is used to create the appropriate security
association. The type of this IP address is determined by
the value of the pktcNcsEndPntStatusCallIpAddressType
object."
 ::= { pktcNcsEndPntConfigEntry 30 }

pktcNcsEndPntStatusError  OBJECT-TYPE
SYNTAX      INTEGER {
   operational (1),
   noSecurityAssociation (2),
   disconnected (3)
 }
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "This object contains the error status for this interface.
The operational status indicates that all operations
necessary to put the line in service have occurred, and the
CMS has acknowledged the RSIP message successfully. If
pktcMtaDevCmsIpsecCtrl is enabled for the associated Call
Agent, the noSecurityAssociation status indicates that no
Security Association (SA) yet exists for this endpoint.
Otherwise, the state is unused. The disconnected status
indicates one of the following two:
If pktcMtaDevCmsIpsecCtrl is disabled, then no security association is involved with this endpoint. The NCS signaling software is in process of establishing the NCS signaling link via an RSIP exchange. Otherwise, pktcMtaDevCmsIpsecCtrl is enabled, the security Association has been established, and the NCS signaling software is in process of establishing the NCS signaling link via an RSIP exchange.

::= { pktcNcsEndPntConfigEntry 31 }

pktcNcsEndPntConfigMinHookFlash OBJECT-TYPE
SYNTAX Unsigned32 (20..1000)
UNITS "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This is the minimum time a line needs to be on hook for a valid hook flash. The value of this object MUST be greater than the value of pktcNcsEndPntConfigPulseMaxBreakTime. This object must only be set via the configuration file during the provisioning process."
DEFVAL { 300 }
::= { pktcNcsEndPntConfigEntry 32 }

pktcNcsEndPntConfigMaxHookFlash OBJECT-TYPE
SYNTAX Unsigned32 (20..500)
UNITS "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This is the maximum time a line needs to be on hook for a valid hook flash. This object must only be set via the configuration file during the provisioning process."
DEFVAL { 500 }
::= { pktcNcsEndPntConfigEntry 33 }

pktcNcsEndPntConfigPulseDialInterdigitTime OBJECT-TYPE
SYNTAX Unsigned32 (100..1500)
UNITS "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This is the pulse dial inter-digit timeout. This object must only be set via the configuration file during the provisioning process."
DEFVAL { 100 }
::= { pktcNcsEndPntConfigEntry 34 }
pktcNcsEndPntConfigPulseDialMinMakeTime OBJECT-TYPE
SYNTAX Unsigned32 (20..200)
UNITs "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This is the minimum make pulse width for the dial pulse. 
This object must only be set via the configuration file 
during the provisioning process."
DEFVAL { 25 }
::= { pktcNcsEndPntConfigEntry 35 }

pktcNcsEndPntConfigPulseDialMaxMakeTime OBJECT-TYPE
SYNTAX Unsigned32 (20..200)
UNITs "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This is the maximum make pulse width for the dial pulse. 
This object must only be set via the configuration file 
during the provisioning process."
DEFVAL { 55 }
::= { pktcNcsEndPntConfigEntry 36 }

pktcNcsEndPntConfigPulseDialMinBreakTime OBJECT-TYPE
SYNTAX Unsigned32 (20..200)
UNITs "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This is the minimum break pulse width for the dial pulse. 
This object must only be set via the configuration file 
during the provisioning process."
DEFVAL { 45 }
::= { pktcNcsEndPntConfigEntry 37 }

pktcNcsEndPntConfigPulseDialMaxBreakTime OBJECT-TYPE
SYNTAX Unsigned32 (20..200)
UNITs "Milliseconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This is the maximum break pulse width for the dial pulse. 
This object must only be set via the configuration file 
during the provisioning process."
DEFVAL { 75 }
::= { pktcNcsEndPntConfigEntry 38 }

Beacham/Kumar/Channabasappa Expires - July 2004 [Page 50]
pktcSigNotification  OBJECT IDENTIFIER ::= { pktcSigMib 0 }
pktcSigConformance  OBJECT IDENTIFIER ::= { pktcSigMib 3 }
pktcSigCompliances  OBJECT IDENTIFIER ::= { pktcSigConformance 1 }
pktcSigGroups    OBJECT IDENTIFIER ::= { pktcSigConformance 2 }

-- compliance statements

pktcSigBasicCompliance  MODULE-COMPLIANCE
  STATUS     current
  DESCRIPTION
    " The compliance statement for devices that implement
    Signaling on the MTA."

MODULE -- pktcSigMib

-- unconditionally mandatory groups

MANDATORY-GROUPS {
  pktcSigGroup
}

GROUP pktcNcsGroup
  DESCRIPTION
    " This group is mandatory for any MTA implementing NCS
    signaling"

GROUP pktcInternationalGroup
  DESCRIPTION
    " This group is mandatory for any MTA implementing
    international telephony features. In such cases, it is
    left to manufacturers to determine whether to support both
    PacketCable and IPCablecom objects in the same MTA."
  ::= { pktcSigCompliances 1 }

-- units of conformance

pktcSigGroup  OBJECT-GROUP
  OBJECTS {
    pktcSigDevCodecType,
    pktcSigDevCodecMax,
pktcSigDevEchoCancellation,
pktcSigDevSilenceSuppression,
pktcSigDevR0Cadence,
pktcSigDevR6Cadence,
pktcSigDevR7Cadence,
pktcSigDevR0Cadence,
pktcSigDevR6Cadence,
pktcSigDevR7Cadence,
pktcSigDefCallSigDscp,
pktcSigDefMediaStreamDscp,
pktcSigDevVmwiMode,
pktcSignalingType,
pktcSignalingVersion,
pktcSignalingVendorExtension,
pktcSigDefNcsReceiveUdpPort,
pktcSigServiceClassNameUS,
pktcSigServiceClassNameDS,
pktcSigServiceClassNameMask,
pktcSigNcsServiceFlowState,
pktcSigDevR1Cadence,
pktcSigDevR2Cadence,
pktcSigDevR3Cadence,
pktcSigDevR4Cadence,
pktcSigDevR5Cadence,
pktcSigDevRgCadence,
pktcSigDevRsCadence
}

STATUS current
DESCRIPTION
"Group of objects for the common portion of the
PacketCable Signaling MIB."
::= { pktcSigGroups 1 }

pktcNcsGroup OBJECT-GROUP
OBJECTS {
pktcNcsEndPntConfigCallAgentId,
pktcNcsEndPntConfigCallAgentUdpPort,
pktcNcsEndPntConfigPartialDialTO,
pktcNcsEndPntConfigCriticalDialTO,
pktcNcsEndPntConfigBusyToneTO,
pktcNcsEndPntConfigRingBackTO,
pktcNcsEndPntConfigReorderToneTO,
pktcNcsEndPntConfigStutterDialToneTO,
pktcNcsEndPntConfigTSMax,
pktcNcsEndPntConfigMax1,
pktcNcsEndPntConfigMax2,
pktcNcsEndPntConfigMax1QEnable,
pktcNcsEndPntConfigMax2QEnable,
pktcNcsEndPntConfigMWD,
pktcNcsEndPntConfigTdinit,
pktcNcsEndPntConfigTdmin,
pktcNcsEndPntConfigTdmax,
pktcNcsEndPntConfigRtoMax,
pktcNcsEndPntConfigRtoInit,
pktcNcsEndPntConfigLongDurationKeepAlive,
pktcNcsEndPntConfigThist,
pktcNcsEndPntConfigStatus,
pktcNcsEndPntConfigCallWaitingMaxRep,
pktcNcsEndPntConfigCallWaitingDelay,
pktcNcsEndPntStatusCallIpAddressType,
pktcNcsEndPntStatusCallIpAddress,
pktcNcsEndPntStatusCallIpAddress,
pktcNcsEndPntStatusCallError
}

STATUS current
DESCRIPTION
"Group of objects for the NCS portion of the PacketCable
Signaling MIB. This is mandatory for NCS signaling."
::= { pktcSigGroups 2 }

pktcInternationalGroup OBJECT-GROUP
OBJECTS {
pktcNcsEndPntConfigMinHookFlash,
pktcNcsEndPntConfigMaxHookFlash,
pktcNcsEndPntConfigPulseDialInterdigitTime,
pktcNcsEndPntConfigPulseDialMinMakeTime,
pktcNcsEndPntConfigPulseDialMaxMakeTime,
pktcNcsEndPntConfigPulseDialMinBreakTime,
pktcNcsEndPntConfigPulseDialMaxBreakTime,
pktcSigDevRingCadence,
pktcSigDevStandardRingCadence,
pktcSigDevRingSplashCadence,
pktcSigDevCallerIdSigProtocol,
pktcSigDevCIDMode,
pktcSigDevCIDFskAfterRing,
pktcSigDevCIDFskAfterDTAS,
pktcSigDevCIDFskAfterRPAS,
pktcSigDevCIDRingAfterFSK,
pktcSigDevCIDDTASAAfterLR,
pktcSigDevVmwiFskAfterDTAS,
pktcSigDevVmwiFskAfterRPAS,
pktcSigDevVmwiDTASAAfterLR,
pktcSigPowerRingFrequency,
pktcSigPulseSignalType,
pktcSigPulseSignalFrequency,
pktcSigPulseSignalDbLevel,
pktcSigPulseSignalDuration,
5. Acknowledgments

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6. Normative References


-- NOTES TO RFC EDITOR (to be removed prior to publication)
--
-- The I-D <draft-ietf-ops-rfc3291bis-01.txt> (or a successor) is
-- expected to eventually replace RFC 3291. If that draft (or a
-- successor) is published as an RFC prior to, or concurrently with
-- this document, then the normative reference [RFC3291] should be
-- updated to point to the replacement RFC, and the reference tag
-- [RFC3291] should be updated to match.
--


7. Informative References

[RFC3261] Rosenberg, J., Schulzrinne H., Camarillo, G., Johnston,


[ETSI TS 101 909-9] ETSI TS 101 909-9:"Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 9: IPCablecom Network Call Signalling (NCS) MIB Requirements".

[EN 300 001] EN 300 001 V1.5.1 (1998-10):"European Standard (Telecommunications series) Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN; Chapter 3: Ringing signal characteristics (national deviations are in Table 3.1.1)".

[EN 300 324-1] EN 300 324-1 V2.1.1 (2000-04):"V Interfaces at the digital Loop Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".

[EN 300 659-1] EN 300 659-1: "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On hook data transmission".


There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

The following Differentiated Services Code Point (DSCP) and mask objects are used to differentiate between various types of traffic in the service provider network:

- pktcSigDefCallSigDscp
- pktcSigDefMediaStreamDscp
- pktcSigServiceClassNameMask

These objects may contain information that may be sensitive from a business perspective. For example, they may represent a customer’s service contract that a service provider chooses to apply to a customer’s ingress or egress traffic. If these objects are SET maliciously, it may permit unmarked or inappropriately marked signaling and media traffic to enter the service provider network, resulting in unauthorized levels of service for customers.

The following objects determine ring cadence, repeatable characteristics, signal duration, and caller id subscriber line protocol for telephony operation:

- pktcSigDevR0Cadence
- pktcSigDevR1Cadence
- pktcSigDevR2Cadence
- pktcSigDevR3Cadence
- pktcSigDevR4Cadence
- pktcSigDevR5Cadence
- pktcSigDevR6Cadence
- pktcSigDevR7Cadence
- pktcSigDevRgCadence
- pktcSigDevCallerIdSigProtocol
- pktcSigPulseSignalDuration
- pktcSigPulseSignalPauseDuration

If these objects are SET maliciously, it may result in unwanted operation, or a failure to obtain telephony service from client (MTA) devices.
The objects in the pktcNcsEndPntConfigTable are used for end point signaling. The pktcNcsEndPntConfigCallAgentId object contains the name of the call agent, which includes the call agent FQDN. If this object is SET maliciously, the MTA will not be able to communicate with the call agent, resulting in a disruption of telephony service. The pktcNcsEndPntConfigCallAgentUdpPort object identifies the UDP port for NCS signaling traffic. If this object is SET maliciously, the call agent will not receive NCS signaling traffic from the MTA, also resulting in a disruption of telephony service.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. The most sensitive is pktcNcsEndPntStatusCallIpAddress within pktcNcsEndPntConfigTable. This information itself may be valuable to would-be attackers.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

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